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Lung Transplantation in the New Era of Cystic Fibrosis Treatment

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Introduction

Cystic Fibrosis (CF) is a genetic disorder that primarily affects the lungs and digestive system. Over the years, advancements in medical research and technology have significantly improved the management of CF. However, for some patients with advanced lung disease lung transplantation remains the only viable option. In recent years, lung transplantation for CF has entered a new era characterized by improved outcomes, innovative surgical techniques and evolving strategies to enhance post-transplant care [1]. Cystic fibrosis is caused by mutations in the CFTR gene, leading to the production of thick, sticky mucus in the lungs, pancreas and other organs. Lung disease is the leading cause of morbidity and mortality in CF patients, with progressive decline in lung function over time. Despite advancements in CF management, many patients eventually develop end-stage lung disease, necessitating lung transplantation [2].

Description

Early attempts at lung transplantation in CF patients faced numerous challenges, including high rates of infection, rejection and limited donor availability [3]. With improvements in immunosuppressive therapies, surgical techniques and patient selection criteria, lung transplantation outcomes have significantly improved. The development of the lung allocation score system has facilitated better matching of donor lungs to recipients, optimizing outcomes. Minimally invasive surgical approaches, such as video-assisted thoracoscopic surgery have reduced post-operative pain and complications in lung transplant recipients. *Ex vivo* lung perfusion has emerged as a promising technique for assessing and improving the quality of donor lungs, potentially expanding the donor pool and reducing transplant waiting times. Utilization of extended criteria donors and donation after circulatory death donors has increased the availability of donor lungs for transplantation, addressing the growing demand [4].

Multidisciplinary care teams play a crucial role in optimizing pre-transplant evaluation, including nutritional support, infection control and psychosocial assessment. Post-transplant care focuses on immunosuppression management, infection prophylaxis and monitoring for complications such as chronic rejection and opportunistic infections. Enhanced rehabilitation programs and support services help patients adjust to life post-transplant and improve overall quality of life. Despite improvements, challenges such as organ shortage, transplant-related complications and long-term graft survival remain significant concerns. Ongoing research efforts aim to address these challenges through innovations in organ preservation techniques, immunomodulatory therapies and regenerative medicine approaches. Personalized medicine approaches, including genetic profiling and targeted therapies, hold promise for optimizing outcomes and minimizing complications in CF lung transplant recipients [5].

Conclusion

Lung transplantation has transformed the prognosis and quality of life for many patients with end-stage cystic fibrosis. With advancements in surgical techniques, donor management and post-transplant care, the field of lung transplantation for CF has entered a new era characterized by improved outcomes and expanded opportunities for patients in need. However, ongoing research and innovation are essential to address remaining challenges and further enhance the long-term success of lung transplantation in cystic fibrosis. Through collaborative efforts among clinicians, researchers and patients, we can continue to advance the field and improve the lives of individuals affected by this complex disease.

Acknowledgement

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Conflict of Interest

None.

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